



User Manual GTM-1

Reference: **WI_DEV_DEN_UGD_002**



Version: **002**

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1 Introduction

1.1 Scope and Outline of this Specification

This document is the hardware and system User Manual for the GTM-1. The GTM-1 is a CDMA communications module for In-vehicle telematics service.

2 Terminology

Table 1. Terminology

Abbreviation	Definition
CSD	Circuit Switched Data
deg	In this document, “deg” represents a temperature unit meaning “degree(s) Celsius”.
DTMF	Dual Tone Multiple Frequency
E/C	Echo Cancellation
GPIO	General Purpose I/O
GPS	Global Positioning System
N/C	Noise Cancellation
OTA	Over The Air activation
OTAPA	OTA Parameter Administration
OTASP	OTA Service Provisioning
RTC	Real Time Clock
SMS	Short Message Service
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

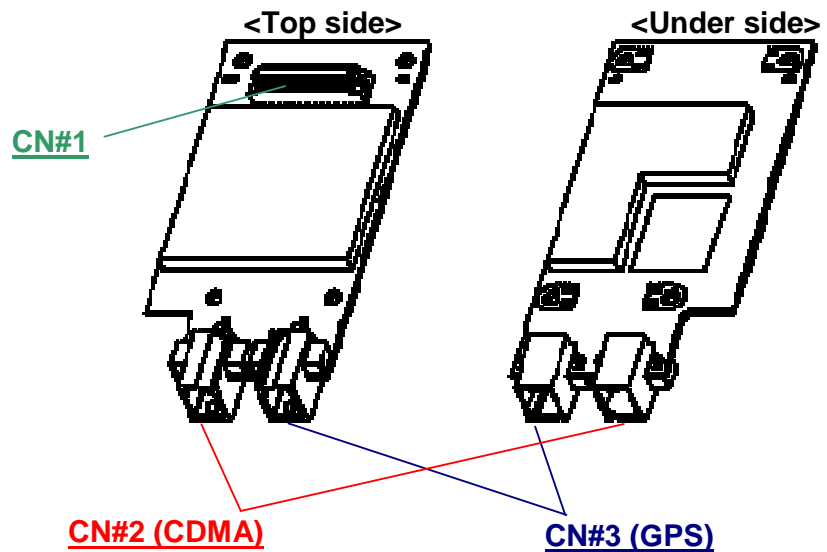
3 Structure of GTM-1 Outline

The outline specifications of the GTM-1 are listed in the following table.

Table 2. Dimensions of GTM-1

Item	Description
Printed circuit board	Overall dimensions: 54mm * 105mm t = 1.6mm +/- 0.1 See 6 for the detail dimension.
CN#1	60 pins board-to-board connector is used.
CN#2 (I/F to CDMA antenna)	RF connector is used.
CN#3 (I/F to GPS antenna)	RF connector is used.

Outline drawing
(Reference)



4 Main Features

The main features of the GTM-1 are presented in the table below.

Table 3. Main Features of GTM-1

Item	Specification		Notes
Frequency Band	Band Class0	Tx: 824~849 MHz Rx: 869~894MHz	
	Band Class1	Tx: 1850~1910 MHz Rx: 1930~1990MHz	
Specifications	CDMA2000 1X IS98-e		
Max Power output	Band Class 0	+24dBm (251.12 mW) +/- 1dB	
	Band Class 1	+24dBm (251.12 mW) +/-1dB	
Supply voltage	4V +/-5%		
Current consumption			
In Communication	900mA MAX		
Hardware Features			
GPS	Autonomous GPS (Not BS assisted)		
Operating temperature	-30°C to +70°C		Ambient temperature
Storage temperature	-40°C to +85°C		Ambient temperature

Note: The GTM-1 meets the characteristics described in Table 3 at all temperatures within the operating temperature range.

4.1 CDMA Antenna Connector CN#2

The CDMA antenna cable interfaces to connector CN#2.

The maximum allowable antenna system gain in the 850 MHz band is 6.76 dBd.

The maximum allowable antenna system gain in the PCS band is 8 dBi.

4.2 GPS Antenna Connector CN#3

The GPS antenna cable interfaces to connector CN#3.

The GTM-1 includes a GPS function for the acquisition of vehicle location information.

4.3 GPS Antenna Specification

The GTM-1 GPS Antenna performance is described below.

Item	Description
Frequency	1575.42+/-1.023MHz
Polarization	RHCP
Input impedance	50ohm (VSWR =3 or less)
Gain	+15 to +30 dBic (= Antenna gain + LNA gain + cable loss)
Isolation between CDMA antenna and GPS antenna.	10 dB or more

5 Operation Specification

5.1 Environmental Condition

The GTM-1, installed in its enclosure, meets the requirements described under the environmental operating conditions shown in Table 4.

Table 4. Environmental Operating Conditions

Item	Rating	Unit
Absolute Maximum Rating	5	V
Ambient Operating temperature	-30 to +70	deg. C
Ambient Storage temperature	-40 to +85	deg. C
Humidity	95 or less	%

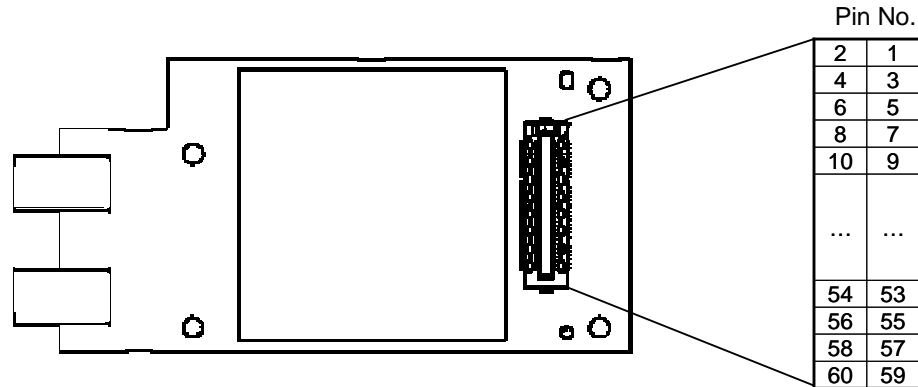
5.2 RoHS and VOC Compliance

The GTM-1 is Lead-free, including all components and solder.

The GTM-1 is in compliance with the RoHS (Restriction of Hazardous Substances) mandate.

The GTM-1 is in compliance with the VOC (Volatile Organic Compounds) mandate.

7 Pin Names and Pinout of CN#1



7.1 Pin Arrangement

The table below presents the pin names for each pin as presented in the figure above.

Table 5. Pins and Corresponding Pin Names

Pin name	Pin No.	Pin No.	Pin name
GND2	2	1	GPO21
SDN1	4	3	IOVCC
GPI18	6	5	RESETX
VCC2	8	7	GPI6
VCC1	10	9	GPO12
GPO25	12	11	GPO14
POWOFF	14	13	GPI5
GPI20	16	15	GPO13
GPO23	18	17	GPI1
GPO11	20	19	GPI0
GPO8	22	21	SUP2
GPI2	24	23	SDN2
RSTCLK	26	25	DAC1
GPI4	28	27	GPI15
GPI3	30	29	AD2
I2CD	32	31	MIC2_N
I2CC	34	33	MIC2_P

Pin name	Pin No.	Pin No.	Pin name
GPI7	36	35	GPI22
AD1	38	37	VOR-
SP2_N	40	39	VOR+
SP2_P	42	41	USBG
GPI16	44	43	GPO9
VOT-	46	45	USBV
VOT+	48	47	GPI24
VOG	50	49	GPI19
GND3	52	51	GND4
USBS1	54	53	GPO21
USB-	56	55	IOVCC
USB+	58	57	RESETX
USBS2	60	59	GPI6

8 FCC Certification

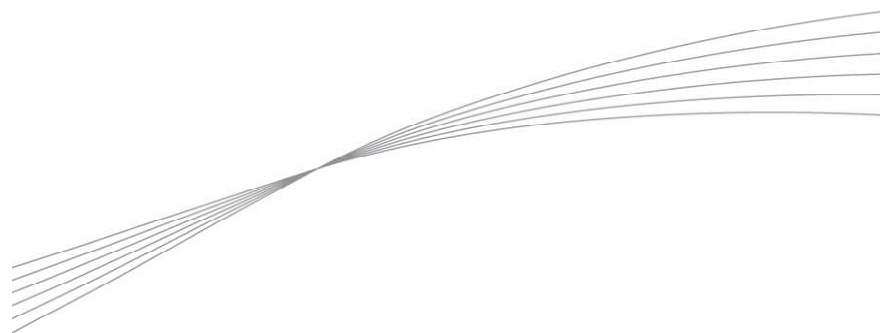
The GTM-1 is FCC certified as a 'mobile device', which requires a minimum distance of 20 cm between the application's antenna and the human body.

Per FCC Section 15.21, any changes or modifications to the GTM-1 not expressly approved by Wavecom could void the user's authority to operate the equipment.

Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Wavecom's FCC ID may be used by the integrator if the following conditions are followed:

1. The application must be implemented as a "mobile device" and not a "portable device."
2. The application's user and installation manuals must include a statement that a minimum distance of 20 cm between the antenna and the human body is required.
3. The antenna system gain must be within the following constraints:
 - a) 850 MHz Band: the antenna system gain must not exceed 6.76 dBd gain.
 - b) 1900 MHz PCS Band: the antenna system gain must not exceed 8 dBi gain.
4. The licensed module will have a FCC ID label on the module itself. The FCC ID label must be visible as defined by the FCC (visible through an open access door is permissible), or a separate label must be similarly visible that conveys the message: "Contains Transceiver Module FCC ID: O9EGTM1."



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